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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/857,348	07/24/2001	Fredrik Persson	66477-012-5	3135

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EXAMINER	
MACARTHUR, VICTOR L	

ART UNIT	PAPER NUMBER
3679	

DATE MAILED: 08/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/857,348	PERSSON ET AL.	
	Examiner	Art Unit	
	Victor MacArthur	3679	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 February 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 June 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the limitations "the grooves engaging and deforming the side surface" (line 9-10 of claim 21), "the grooves engage and deform the side surface" (line 11 of claim 29) and "the grooves penetrate and permanently deform the bearing member" (lines 1-2 of claims 26 and 35) must be shown or the features canceled from the claims. No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Priority

Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Sweden on 12/03/1998. It is noted, however, that a copy of a certified copy of the priority document has not been received.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 21-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clavel U.S. Patent 4976582 in view of Latzen U.S. Patent 2733085 and Matsuoka (U.S. Patent 4,430,016).

Claim 21. Clavel discloses (fig.2) an industrial robot, comprising: at least one linkage device (5) comprising pull rods (5a, 5b); and a multi-joint system operatively connected to the linkage device, the multi-joint system comprising a plurality of three-axle ball and socket joints (26a, 26b, 27a, 27b as described in col.3, ll.43-45). Clavel does not expressly state the specific details of the ball and socket joint. Latzen teaches (fig.1) that it is desirable for ball and socket joints to have the following details: each joint comprising a joint ball (1) and a joint socket (2, 7), the joint socket enclosing the joint ball with a space that comprises approximately on-half the ball or less, the joint socket further comprising a housing (2) and at least one removable annular bearing (7) member arranged in the housing, the housing comprising a surface (surface of 2 contacting 15) against which a side surface of the at least one bearing member abuts, the surface

comprising a plurality of friction-increasing grooves (grooves in 2 receiving 15) extending in a longitudinal direction of the surface, the grooves engaging and **deforming** (in as much as the applicant's finished product does) the side surface of the at least one bearing member and being operative to increase friction between the at least one bearing member and the housing to rotationally immobilize the at least one bearing member in the housing (emphasis added). Latzen states that such specific details are desirable for improving tolerances and lubricating conditions (col.1, ll.23-25). Neither Clavel nor Latzen expressly state what material the bearing should be made of. Matsuoka teaches (figs.1 and 3) that it is desirable to make bearings (4) from a polymeric material for the purpose of improving lubrication (col.3, ll.13-17). Therefore, it would have been obvious to one with ordinary skill in the art at the time the invention was made to use ball and socket joints, with details taught by Latzen and Matsuoka, for the ball and socket joints of Clavel, since such details are desirable for improving tolerances and lubricating conditions. Regarding the limitation "deforming", it appears that the applicant's fully assembled robot joint does not incur any deformation in the bearing element after assembly since deformation requires active movement and the applicants side surface is static with respect to the grooves. It is only during assembly when the bearing is inserted into the housing that any deformation occurs. As such, this limitation describes a method of forming. Since claim 1 is a product claim the specific method of forming is not germane to the issue of patentability of the device itself. Therefore, the limitation "deforming" has been given only limited patentable weight. See MPEP § 2113.

Claim 22. Clavel discloses that the industrial robot comprises a delta robot (in as much as the applicant's invention does). See Applicant's Specification (p.1, ll.17-19).

Claim 23. Latzen further teaches the specific detail of the grooves being aligned at an angle (zero degrees such that the grooves are parallel to the longitudinal axis) with respect to a longitudinal axis of the bearing member. Note that the preferred embodiment of the applicant's invention also comprises an angle of zero degrees such that the grooves are parallel with the longitudinal axis (Specification, p.3, ll.27-30). It would have been obvious to include this additional detail by the same reasoning stated in the rejection of claim 21 above.

Claim 24. Latzen further teaches the specific detail of the grooves including pointed tops (as seen in fig.1). It would have been obvious to include this additional detail by the same reasoning stated in the rejection of claim 21 above.

Claim 25. Latzen further teaches the specific detail of the at least one bearing member comprising a plurality of grooves (15) extending in a longitudinal direction of the side surface and compatible with the grooves in the housing. It would have been obvious to include this additional detail by the same reasoning stated in the rejection of claim 21 above.

Claim 26. Latzen further teaches the specific detail of the grooves penetrating with the bearing member being permanently deformed (into its final product shape). It would have been obvious to include this additional detail by the same reasoning stated in the rejection of claim 21 above. The limitation "permanently deform" describes a method of forming as stated in the rejection of claim 21 above. The method of forming is not germane to the issue of patentability of the device itself. Therefore, the limitation "permanently deform" has been given only limited patentable weight. See MPEP § 2113.

Claim 27. Latzen further teaches the specific detail of the housing and the bearing member each having a socket shape, wherein a spring force (contact force) holds the ball and

socket joint together (in as much as the applicant's invention does) and fixes the bearing member in place. It would have been obvious to include this additional detail by the same reasoning stated in the rejection of claim 21 above.

Claim 28. Latzen further teaches the specific detail of the at least one bearing member being pressed to fit tightly in the housing (in as much as the applicant's invention is).

Claim 29. Clavel as modified by Latzen and Matsuoka in the rejection to claim 21 above discloses all of the method steps required to make the joint of claim 29 with the exception of the method step of "the grooves [of the housing] engage the side surface of the at least one bearing member". Rather Latzen teaches the opposite: grooves (15) on the bearing element engaging the housing (2) to deform the housing (as seen in fig.1). However, the reversal of components in a prior art reference is a design consideration within the skill of the art. In re Gazda, 219 F.2d 449, 104 USPQ 400 (CCPA 1955); In re Japikse, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950). Furthermore, such reversal would better allow for replacement of a worn bearings since each new bearing would be deformed to fit the housing exactly. Therefore, it would have been obvious to reverse the positioning such that grooves are located in the housing such that they engage the bearing element to deform the bearing element; since such practice better allows for replacement of bearings and is a design consideration within the skill of the art.

Claim 30. The above modification fixes a location of the bearing member in the robot (in that it is not free to move after installation).

Claim 31. Clavel discloses that the industrial robot comprises a delta robot (in as much as the applicant's invention does). See Applicant's Specification (p.1, ll.17-19).

Claim 32. Latzen further teaches the specific detail of the grooves being aligned at an angle (zero degrees such that the grooves are parallel to the longitudinal axis) with respect to a longitudinal axis of the bearing member. Note that the preferred embodiment of the applicant's invention also comprises an angle of zero degrees such that the grooves are parallel with the longitudinal axis (Specification, p.3, ll.27-30). It would have been obvious to include this additional detail by the same reasoning stated in the rejection of claim 21 above.

Claim 33. Latzen further teaches the specific detail of the grooves including pointed tops (as seen in fig.1). It would have been obvious to include this additional detail by the same reasoning stated in the rejection of claim 21 above.

Claim 34. Latzen further teaches the specific detail of the at least one bearing member comprising a plurality of grooves (15) extending in a longitudinal direction of the side surface and compatible with the grooves in the housing. It would have been obvious to include this additional detail by the same reasoning stated in the rejection of claim 21 above.

Claim 35. The modification for reversal of parts as detailed in claim 29 suggests that the grooves penetrate with the bearing member being permanently deformed (into its final product shape).

Claim 36. Latzen further teaches the specific detail of the housing and the bearing member each having a socket shape, wherein a spring force (contact force) holds the ball and socket joint together (in as much as the applicant's invention does) and fixes the bearing member in place. It would have been obvious to include this additional detail by the same reasoning stated in the rejection of claim 21 above.

Claim 37. Latzen further teaches the specific detail of the at least one bearing member being pressed to fit tightly in the housing (in as much as the applicant's invention is).

Response to Arguments

Applicant's arguments with regard to the claim rejections have been fully considered but they are not persuasive.

The applicant argues that Latzen does not suggest a housing that includes grooves. This is not persuasive since Latzen teaches (fig.1) a housing (2) that has grooves (grooves formed by, and receiving, element [15]).

The applicant argues that Latzen does not discloses that the housing is deformed by the bearing. This is not persuasive since figure (1) clearly shows a housing (2) that is deformed by grooves (15) of the bearing (7). In fact figure 1 of Latzen shows this deformation more clearly than the applicant's own drawings.

The applicant argues that Matsuoka does not disclose a housing including grooves, or a ball and socket joint space of about one-half. This is not persuasive since Matsuoka was only relied upon to teach a polymeric bearing material.

The applicant arguments with regard to Rosheim are moot since the current rejection does not rely upon Rosheim.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor MacArthur whose telephone number is (571) 272-7085. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel P. Stodola can be reached on (571) 272-7087. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-3600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197.

VLM
July 20, 2005

Daniel P. Stodola

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